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A 428
R 31
33-70

March 1962

ARS-33-70

United States Department of Agriculture
Agricultural Research Service

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CORN EARWORM RESISTANCE IN SWEET CORN INBREDS RELEASED
BY SEVERAL STATE EXPERIMENT STATIONS^{1, 2/}

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Each year from 1941 to 1961, 300 to 500 sweet corn inbreds have been tested for resistance to the corn earworm (Heliothis zea (Boddie)). During this time, most of the State and Federal sweet corn breeders have sent their more promising selections for testing. Many of the inbreds included in this report were tested during the early years of their development and before final numbers were assigned for their release. However, only results from tests made after the final numbers were assigned to the inbreds and they were released are shown in table 1. After the first year of testing, seed used for retesting of each inbred was usually selected and grown in our own plots at Lafayette, Ind.

A uniform system of testing was used throughout. The ears were self pollinated by the author to eliminate any possible outside effect, and hand infested under the selfing bags with a uniform number of newly hatched larvae. The ears were then allowed to mature, after which they were husked and graded to determine the amount of earworm injury.

A uniform system of grading was also used. Ear injury was recorded as units of area injured, with the unit about equal to the area of an average-sized Golden Cross Bantam kernel.

^{1/} Information presented in this paper supplements that given in Bureau of Entomology and Plant Quarantine Circular E-745 (April 1948), "Corn Earworm Resistance in Sweet Corn Inbreds and Hybrids" by E. V. Walter, and that in ARS-33-46 (March 1958), "Corn Earworm Resistance in Commercial Sweet Corn Hybrids" by E. V. Walter, George Wene, Texas Agricultural Experiment Station, and E. D. Harris, Jr., University of Florida Agricultural Experiment Station.

^{2/} Corn inbreds tested in this study were furnished through the courtesy of the following Agricultural Experiment Stations: Connecticut, Illinois, Indiana, Maine, Ohio, and Wisconsin.

Table 1.--Earworm reaction of sweet corn inbreds released by State experiment stations, 1941-1961.

Location of station where inbred released	Inbred	Number of seasons tested	Average earworm injury (percent)
Connecticut	C6A	2	188
	C13 etgl	1	201
	C17-2	2	170
	C30	1	209
	C53	3	157
	C68	3	119
Illinois	5	5	83
	6	5	123
	8	4	112
	10	5	120
	11	3	103
	13	3	110
	14a	3	85
	14n	13	92
	18b	2	96
	27a	3	93
	31a	3	89
	44b	3	101
	47a	1	83
	73c	14	119
	101q	1	87
	101t	4	68
	101u	2	137
	103a	2	60
	104b	1	106
	104c	1	80
	107a	10	97
	110a	1	100
	110d	1	139
110g	1	93	
304a	1	167	
318a	2	172	
325a	1	129	
Iowa	IP39	2	118
	I45	15	105
	H60	2	121
	191	1	167

Table 1. (Cont.)

Location of station where inbred released	Inbred	Number of seasons tested	Average earworm injury (percent)
Iowa (cont.)	453	5	149
	467	4	107
	1445	3	77
	1627	1	109
	2021	1	118
	2051	1	72
	2132	1	121
	2056	2	123
	2508	4	109
	2730	3	143
	3001	2	95
	3005	2	80
	3006	2	135
	3015	2	152
	3044	4	116
	4011	3	64
	5125	4	110
	5145	3	146
	6038	2	127
Maine	Me2rt	2	135
Ohio	51 K2	3	72
	55	5	139
USDA-Indiana	166	9	37
	245	8	54
	471-U6	6	89
	81-1	6	30
	G8	5	125
	P22	1	75
	P39	14	130
	P39A	12	146
	P51	14	138
P51B	8	117	
Wisconsin	WC 7	1	148
	W 3647	1	148
	W 3670	1	119
	W 3742	1	176

For each year's tests, the average injury for all inbreds was computed, and the injury of an individual inbred was expressed as a percentage of this average. No single inbred was grown every year, thus making it necessary to use this yearly average as the standard for comparison.

Two or more common inbreds, including P39, P51, I45, or Ill. 73c, were grown each year as checks. In nearly all tests, inbreds grown for 2 or more years gave remarkably similar results. Two exceptions were noted, however. Inbred I45 was tested eight times before 1947 and showed an average injury of 80 percent of all inbreds. I45 was tested seven times since 1947, with an average injury of 133 percent of all inbreds tested. The other exception was Ill. 107a, which showed an average injury of 58 percent of all inbreds in six tests made before 1952 and 155 percent in four tests since that year. It seems possible that for each of these inbreds a susceptible mutant was first selected, since the changes in readings were abrupt and the percentages of injury in the later tests continued to be quite uniform.

An examination of table 1 shows that certain of the inbreds had an average earworm injury of between 60 and 80 percent of all those tested, which indicates a fairly high resistance. It should be realized, however, that some inbreds with the lowest injury percentages were tested only for 1 or 2 seasons and thus the resistance demonstrated was not as reliable as for those tested for 3 or more seasons. Three inbreds, 166, 245, and 81-1, released at the Indiana Experiment Station, Purdue University, in cooperation with the USDA, demonstrated the greatest resistance with injury percentages of from 30 to 54 percent. These inbreds were tested from 6 to 9 seasons and therefore their injury percentages are very reliable.

Breeders have been paying more attention to earworm-resistant sweet corn inbreds during the last 10 years. A compilation of our data shows that the average earworm injury in our plots for this decade was 27 percent less than for the previous decade.



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